(No Model.) 2 Sheets—Sheet 1.

W. MITCHELL.

SOLDERING IRON.

No. 585,688. Patented July 6, 1897.

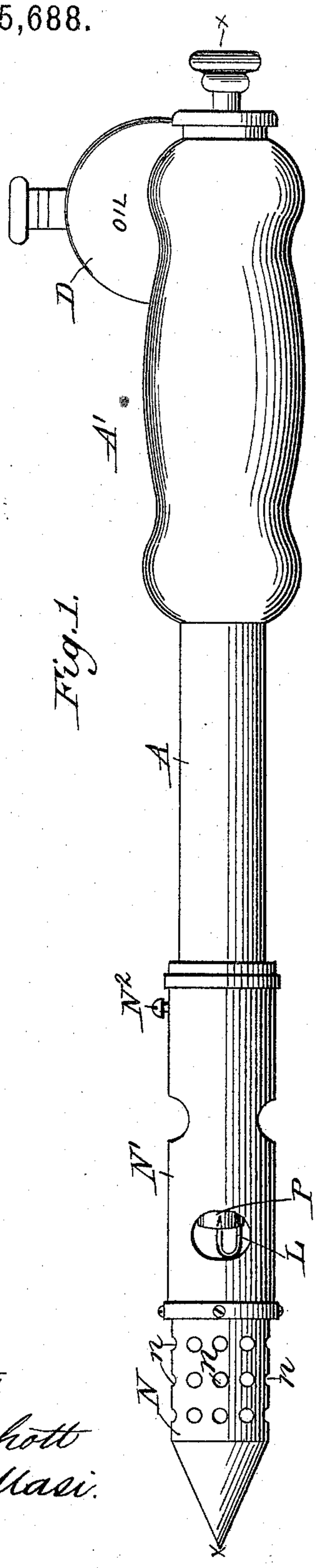

Fig. 1.

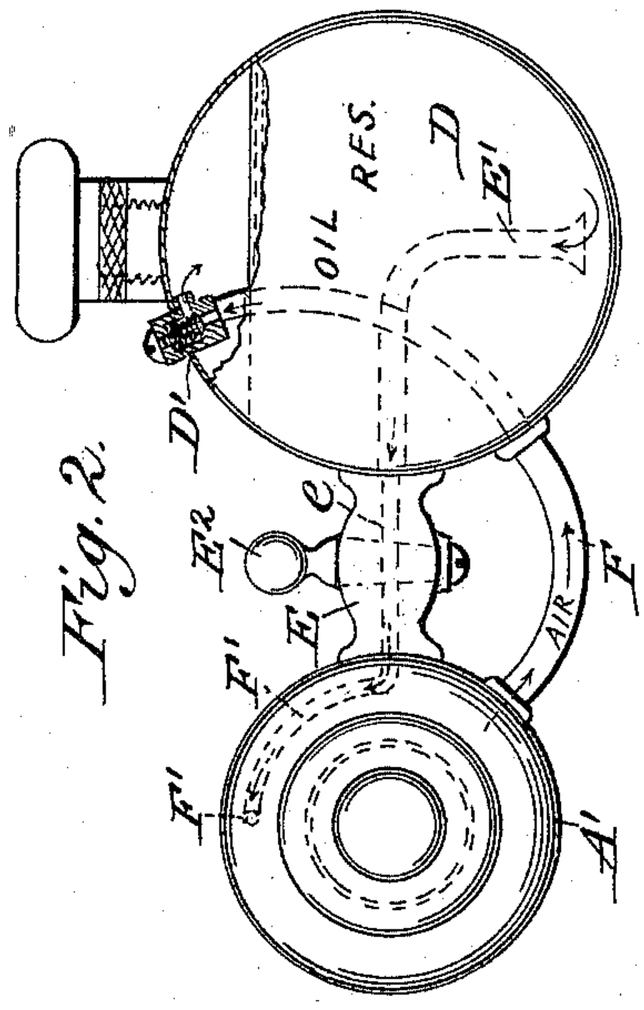

Fig. 2.

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Fig. 3.

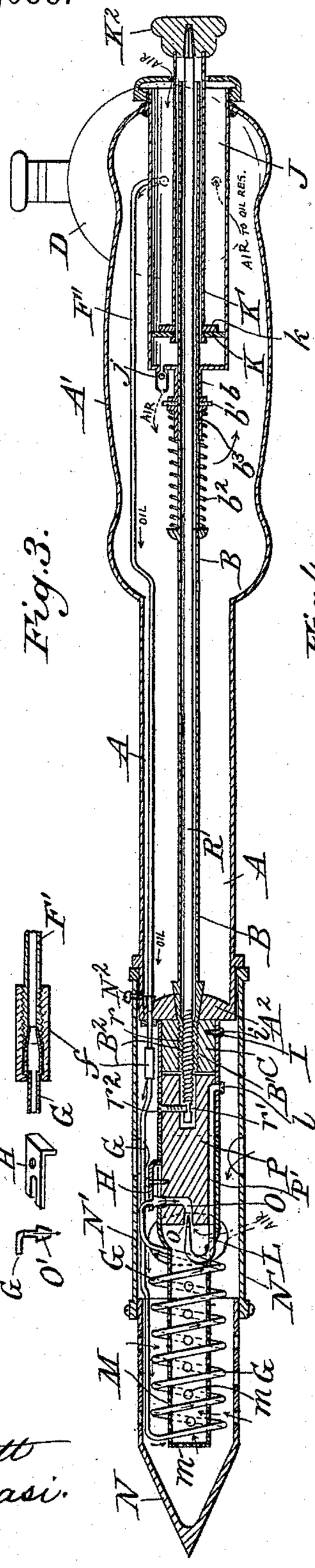

Fig. 4.

Fig. 5.

Fig. 9a.

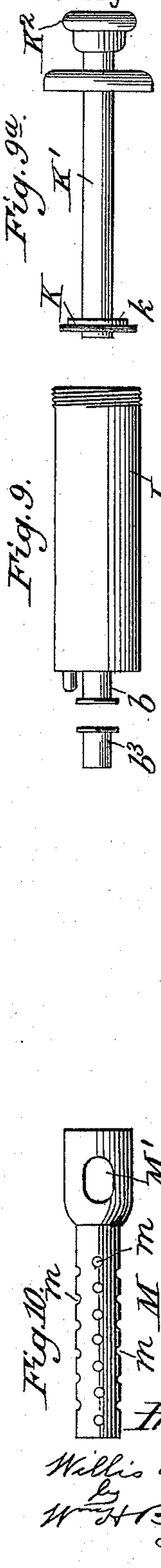

Fig. 9.

Fig. 12.

Fig. 11.

Fig. 6.

Fig. 7.

Fig. 8.

Fig. 10.

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UNITED STATES PATENT OFFICE.

WILLIS MITCHELL, OF MALDEN, MASSACHUSETTS.

SOLDERING-IRON.

SPECIFICATION forming part of Letters Patent No. 585,688, dated July 6, 1897.

Application filed September 23, 1896. Serial No. 606,700. (No model.)

To all whom it may concern:

Be it known that I, WILLIS MITCHELL, a citizen of the United States, residing at Malden, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Soldering-Irons; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to soldering-irons heated by gasolene and similar agents, and especially to those in which the flow of gasolene is controlled at the jet by adjustable means. My application, Serial No. 602,951, presents a recent instance of such devices; but in practice I have found that the construction and combination of parts therein described and claimed possess some defects which are obviated by using a small wire rod reversely bent and pointed for entering the opening of the jet to control the same and relieving the rod which moves the jet longitudinally from immediate action in regulation.

To this end my invention consists principally in the combination of a jet forming part of a heating utensil and a tube or passage for gasolene supplying the said jet, with a reversely-presented point arranged to enter the opening of the said jet and means for adjusting one of the said parts with respect to the other, thereby varying the opening of the jet.

The said invention further consists of certain improvements in details of construction and combination, as hereinafter particularly set forth and claimed.

In the accompanying drawings, Figure 1 represents a side elevation of a soldering-iron embodying my invention; Fig. 2, an end elevation of the same, partly broken away and sectioned; Fig. 3, a longitudinal section through the same on the line x x of Fig. 1. Fig. 4 represents a detail view in elevation of the tubular rod B, hereinafter described, the operating end of the rod being longitudinally sectioned. Fig. 5 represents a similar view unsectioned of the jet-adjusting rod. Fig. 6 represents a longitudinal section of the nut with which the rod B engages. Fig. 7 represents a similar view of the sleeve which surrounds the said nut. Fig. 8 represents a similar view of the jet-block. Fig. 9 represents a side elevation of the air-pump cylinder with the sliding collar b^3 slightly detached. Fig. 9^a represents a detail view, in side elevation, of the piston-rod and piston of the said pump. Fig. 10 represents a side elevation of the tubular burner. Fig. 11 represents a perspective view of the devices making connection between the coil and the jet-passage. Fig. 12 represents a sectional detail view of the coupling between the coil and the gasolene-pipe.

A designates the hollow body of a soldering-iron, enlarged at A′ to form a handle. The forward end of this body is closed by a block or plate A^2, having centrally in it a tapering passage that fits a rigid conoidal collar on a tubular rod B, extending longitudinally through the body A and adjustable endwise to make an air-tight joint between these tapering faces. This endwise tightening is effected by means of a cylindrical nut C, which turns on screw-threads B′, formed externally in the forward end of the said tubular rod beyond the hollow body A. This forward end of the said tubular rod is also provided with internal screw-threads B^2, engaging corresponding threads r on the jet-adjusting rod R, which passes lengthwise through the tubular rod B and has a notch or recess r' formed in it to receive the point of a set-screw r^2, whereby the jet block or tip P is connected to the said rod. Thus the said block or tip travels back and forth with the rod R a very short distance as the latter is turned, but does not turn with it, and the withdrawal of the said rod is also prevented. This turning is effected by means of a knob K^2, which is exterior to the closed handle end of the body A and internally recessed to fit the prismatic protruding end of rod R. This knob is also the operating-handle of the piston-rod K′, attached to piston K, working in pump-cylinder J, which is secured within the enlarged handle part A′ of body A. Said knob can come into contact with rod R for turning the same only when in closest proximity to the end of body A. The said piston-rod is tubular and the rods R and B pass through it, the three being concentric. To make the inner end of pump-cylinder J air-tight where rod B passes through it, a bushing-sleeve b surrounds this rod, being slightly

flanged at its inner end, and a packing-washer b' is forced against the said flanged inner end by a spring b^2 and sliding collar b^3, these parts b b' b^2 b^3 being all mounted on the said rod B. The sleeve b is fast to the end of the cylinder J, and of course will be removed therewith, but the collar b^3 and the spring and washer remain on the rod.

The piston K consists of a flexible disk backed by a rigid collar k and of equal diameter with the interior of the cylinder. The office of the said piston is to drive air out of the cylinder into the interior of body A, a ball-valve j preventing it from returning. A suitable inlet supplies the air thus forced out by this air-pump. From said body A the air passes through an air-tube F into the interior of the gasolene-reservoir D, a cut-off valve D′ serving to prevent this egress except when there is pressure sufficient to force it from its seat. The air enters at the top of the said reservoir. The gasolene under the air-pressure flows up from the bottom of the said reservoir through a downwardly-bent tube E′ to and through a tubular passage e in a rigid bar E, connecting the said reservoir and body A together side by side. A stop-cock E^2, attached to this bar and turning in this passage, cuts off the flow or lets it fully on, or regulates it in any intermediate degree at will. This stop-cock is not absolutely necessary, but serviceable. From the said passage the gasolene flows to a pipe F′, which extends lengthwise of the body A within the same through the front end thereof, where it is connected by a coupling f to one end of a tubular coil G, arranged in front of the jet-opening o, formed by a bent passage O of jet block or tip P. The other end of this coil is bent over and downward to enter the upper (inlet) end of this passage and provided with a tapering enlargement O′, adapted to pack tightly into the said passage. A bifurcated clamp-arm H, attached to the said jet block or tip, aids in holding this end of the coil in place.

I designates a sleeve which surrounds the nut C and the rear part of the jet-block P, being attached to the former by a screw i, but allowing free movement of the jet-block through it. A bent pin or small wire L, approximately of fish-hook form, is attached by a screw l to the inner side of this sleeve. The straight shank of this pin or hook fits in a groove P′ of the said block, so as to economize space, while allowing the said block to move endwise. The sharp reversely-turned point L′ of the said hook is presented opposite the jet-opening.

When the tube B and nut C have once been fixed in position, as before stated, the regulating pin or hook L is relatively stationary, and when the said jet is advanced to or withdrawn from the point thereof by the action of the rod R, as aforesaid, the opening of said jet is correspondingly lessened or increased. The regulating hook or pin L may be very slender, having no strain to undergo, and the jet-opening may be correspondingly small, allowing for very delicate adjustment.

M designates the tubular burner, having air-openings m in its sides and outer end. It passes within the coil and fits on the jet-block P, being slotted at M′ to avoid impediment from the discharging end of said coil and the said clamp-bar.

N designates the hollow point, which is perforated at n, and of copper or other refractory metal, with a German-silver cylindrical extension N′ serving as a case for the burner-coil and jet and secured to the body of the iron, preferably by a screw N^2.

Many of the parts hereinbefore described, as the body, reservoir, air-pump, and connections, are already described and shown in my prior application aforesaid, and I do not here claim them, except as to the novel details of construction above referred to.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In combination with the body, burner, jet-block and point of a soldering-iron, a pipe supplying gasolene to the jet, a relatively-fixed sleeve surrounding the jet, a regulating-point arranged opposite the jet, and fixed with relation thereto, and means for adjusting the jet-block back and forward within the sleeve, in order that the said point may close or open the jet more or less substantially as set forth.

2. In combination with the body, burner, jet-block and point of a soldering-iron, a pipe supplying gasolene to the jet, a relatively-fixed sleeve surrounding the jet, a screw-threaded rod engaging threads in a fixed part and also engaging the said jet-block to move it endwise, and a hook attached to the said sleeve and presenting its point reversely to the said jet substantially as set forth.

3. In combination with the hollow body of a soldering-iron, a tubular rod B extending lengthwise through the said body and having both external and internal screw-threads on its outer end, a nut receiving the said external screw-threads and adapted to be drawn thereby into contact with the end of said body, another rod R within the said rod B threaded to engage with the said internal threads, a jet-block connected to said inner rod R for endwise adjustment, and a regulating-hook presenting its point opposite the jet, substantially as and for the purpose set forth.

4. In combination with the hollow body of a soldering-iron, an air-pump inclosed therein and comprising a tubular piston-rod, a gasolene-receptacle, air and oil pipes for supplying the contents of the same under the action of the said pump to the jet, a jet-block adjustable longitudinally of the said iron, a regulating-point presented opposite the said jet, a tubular rod clamped to the said body and extending lengthwise through the said piston-

rod, and an adjusting-rod extending through the said tubular rod to the said jet-block and adapted to move the latter lengthwise, as set forth.

5. In combination with a hollow soldering-iron body, air-forcing means within the same, a source of oil-supply acted on by such means, communications therefrom to the heating-flame, a rod extending lengthwise through the said body and provided with a conoidal part near the forward end, and means for drawing the said conoidal part and a correspondingly-recessed part of the body together to prevent leakage of air, substantially as set forth.

6. In combination with the jet-block of a soldering-iron or other heated implement, a tubular coil supplied with fuel and arranged to discharge into the jet and be heated thereby, the said coil being provided with a conoidal part at its discharge end and the jet-passage being adapted to receive it, and a bifurcated clamp straddling the said conoidal part, as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

WILLIS MITCHELL.

Witnesses:

E. STROBRIDGE,

CHAS. W. HOWARD.